

Remarks/Arguments

Claims 1-5, 7-14, 16-23, 25-28 and 30-36 are now pending in the present application. Claims 1-5, 7, 8, 10, 11, 13, 16, 17, 19-23, 25-27, 30 and 31 have been amended; and claims 6, 15, 24 and 29 have been canceled. New dependent claims 33-36 have been added. Applicant believes the claims currently in the case patentably distinguish over the cited art, and that the application is now in condition for allowance. Reconsideration of the rejection is, accordingly, respectfully requested in view of the above amendments and the following comments.

I. 35 USC § 112, Second Paragraph

The Examiner has rejected claims 4, 6 and 10 under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

With respect to claims 4 and 6, the Examiner indicates that the limitation “the receiving” lacks sufficient antecedent basis. By the present Amendment, claim 6 has been canceled, and claim 4 has been amended to delete the limitation “the receiving”; and, in general, to provide proper antecedent basis for all terminology therein. Claim 4 is now believed to be clear and definite throughout and to fully satisfy the requirements of 35 USC § 112, second paragraph.

With respect to claim 10, the Examiner contends that the phrase “the receiving comprises receiving the optical signal within the optical modulator comprising a filter...” is indefinite because “it is unclear what method/process applicant is intending to encompass”. In addition, the Examiner states that the claim is indefinite because it claims both an apparatus and method steps of using the apparatus. By the present Amendment, claim 10 has been amended to avoid the indefinite terminology

noted by the Examiner, and to clearly recite a method; and is now believed to satisfy the requirements of 35 USC § 112, second paragraph, in all respects.

II. 35 USC § 102, Anticipation

A. Claims 1, 7, 19 and 25 were rejected under 35 USC § 102(b) as being anticipated by Koren et al. (U. S. Patent No. 5,861,965).

In rejecting claims 1 and 19, the Examiner states:

As to claims 1 and 19, Koren discloses a method and optical communication system comprising:

a plurality of optical modulators (26a, 26b....fig. 3, col. 6, lines 58-60) adapted to optically couple with an optical signal and an optical communication medium, and wherein individual ones of the optical modulators are configured to:

receive a data signal (through element 22, col. 6, lines 1-5);

pass a desired portion of the optical signal having at least one predefined wavelength (col. 6, lines 9-14);

optically modulate the desired portion of the optical signal having the at least one predefined wavelength responsive to the data signal (col. 4, lines 23-31); and

output the desired portion of the optical signal after the modulation for application to the optical communication medium (col. 4, lines 44-46).

Office Action dated September 20, 2004, page 3.

Koren does not disclose “passing a desired portion of the received optical signal, the passed desired portion of the received optical signal having at least one predefined wavelength” as recited in claim 1, and does not disclose “optically modulating the passed desired portion of the received optical signal responsive to the received data signal to provide an optically modulated passed desired portion of the received optical signal” as also recited in claim 1.

The Examiner refers to Col. 6, lines 9-14 of Koren as disclosing passing a desired portion of an optical signal. Col. 6, lines 9-14 of Koren reads as follows:

According to the present invention, fiber delay lines of different lengths are used at each of the output ports of the waveguide grating router 36 to delay one pulse width per channel, and then multiplex, via the multiple port coupler 40, the respective pulses into a repeated pulse sequence.

In Koren, as shown in **Fig. 3**, the optical signals received by modulators 26 are modulated by data signals from data generator 24, and the modulated received signals are output by the modulators to router 42. Koren does not disclose “passing a desired portion of the received optical signal” having at least one predefined wavelength”. Instead Koren passes the entire received optical signal, and has no capability of passing a desired portion of the received optical signal. Accordingly, Koren optically modulates the entire received optical signal, and does not optically modulate a passed desired portion of a received optical signal with a data signal. (Emphasis added.)

For at least all the above reasons, claim 1 is not anticipated by Koren and should be allowable thereover in its present form.

Claim 7 depends from and further restricts claim 1 and is also not anticipated by Koren at least by virtue of its dependency.

Independent claim 19 has been amended in a manner generally similar to claim 1, and is also not anticipated by Koren for substantially the same reasons as discussed above with respect to claim 1. Claim 25 depends from and further restricts claim 19 and is also not anticipated by Koren, at least by virtue of its dependency.

B. Claims 1, 7, 8, 13-19 and 25-32 were rejected under 35 USC § 102(b) as being anticipated by Knox et al. (U.S. Patent No. 5,526,155).

Claim 1 is not anticipated by Knox for similar reasons as discussed above with respect to Koren. In rejecting the claims, the Examiner refers to the Abstract of Knox as disclosing “pass a desired portion of the optical signal having at least one predefined wavelength”.

Knox does not disclose, in the Abstract or elsewhere, “passing a desired portion of the received optical signal, the passed desired portion of the received optical signal having at least one predefined wavelength” as recited in claim 1, and, therefore, also does not disclose “optically modulating the passed desired portion of the received optical signal responsive to the received data signal to provide an optically modulated passed desired portion of the received optical signal” as recited in claim 1. As is clearly recited in the Abstract and elsewhere in Knox, the channel signals received by modulators in Knox are modulated and passed by the modulators. Knox does not disclose modulators having a capability of passing desired portions of a received optical signal and of modulating the passed desired portions of the received optical signal.

Accordingly, Knox does not anticipate claim 1, and claim 1 is believed to be allowable over Knox in its present form.

Claims 7 and 8 depend from and further restrict claim 1, and are also not anticipated by Knox, at least by virtue of their dependency.

Independent claim 13 has been amended to incorporate subject matter originally recited in canceled claim 15, and now recites, in part, combining said encoded-light beams to yield a multiplexed-light beam, “wherein said combining step includes frequency-multiplexing said encoded light beams”. As acknowledged by the Examiner on page 7 of the Office Action, “Knox does not specify the optical modulator to be configured to frequency modulate the designed portions of the optical signals”. For at least this reason, claim 13 is not anticipated by Knox, and withdrawal of the rejection thereunder is respectfully requested.

Claims 14 and 16-18 depend from and further restrict claim 13, and are also not anticipated by Knox, at least by virtue of their dependency.

Furthermore, claim 16 recites “wherein the carrier-light beams share a common carrier wavelength. Knox discloses only that each modulator receives a light beam having different wavelengths than other modulators. Claim 16, accordingly, is not anticipated by Knox and patentably distinguishes over Knox in its own right as well as by virtue of its dependency.

Independent claim 19 has been amended in a similar manner to claim 1 and is not anticipated by Knox for similar reasons as discussed above with respect to claim.

1. Claims 25 and 26 depend from and further restrict claim 19 and are also not anticipated by Knox, at least by virtue of their dependency.

Independent claim 27 has been amended to incorporate subject matter recited in canceled claim 29, and is not anticipated by Knox for reasons similar to claim 13 discussed above. Claims 28 and 30-32 depend from and further restrict claim 27 and are also not anticipated by Knox, at least by virtue of their dependency.

C. Claim 9 was rejected under 35 USC § 102(e) as being anticipated by Roberts et al. (U.S. Patent No. 6,313,932)

In rejecting claim 9, the Examiner asserts, in part, that Roberts discloses:

encoding the data signal upon at least a portion of the optical signal by optically modulating at least the portion of the optical signal using frequency modulation (col. 5, lines 11-13 and col. 9, lines 42-44).

Office Action dated September 20, 2004, page 6.

Applicant respectfully disagrees. Col. 5, lines 11-13 of Roberts states only that a data pulse is encoded upon an optical pulse by means of a modulator array. Col. 9, lines 42-44 of Roberts states only “the channels being associated with respective periodic modulations in frequency space of the spectrum of the transmitted pulse”. Neither recitation referred to by the Examiner discloses “encoding the data signal upon at least a portion of the optical signal by optically modulating at least the portion of the optical signal using frequency modulation” as recited in claim 9.

Roberts states in col. 10, lines 23-26 that actuation of modulating elements allows “a distinct spectral modulation to be introduced into the optical signal” within the transmitted pulse. “Spectral modulation is described in detail in Col. 10, lines 32-63. Roberts discloses use of a Mach Zehnder interferometer to perform spectral modulation, and states in col. 10, lines 62-63 that the spectral modulation may be termed “Fourier modulation in the present context”.

Roberts, accordingly, does not disclose frequency modulation and does not disclose “optically modulating at least the portion of the optical signal using frequency modulation” as recited in claim 9. Claim 9, accordingly, is not anticipated by Roberts.

III. 35 USC § 103, Obviousness

A. Claims 2-6 and 20-24 were rejected under 35 U.S.C. §103 as unpatentable over Knox in view of Roberts.

As to claims 2 and 20, the Examiner acknowledges that Knox does not specify that the optical modulator be configured to frequency modulate desired portions of the optical signals, and cites Roberts as disclosing frequency modulation. For the reasons discussed in detail above, Roberts also does not disclose frequency modulation; and, accordingly, claims 2 and 20 are not obvious in view of Knox and Roberts.

As to claims 3-5 and 21-23, the Examiner states, on page 7 of the Office Action, that Roberts “discloses array modulator as a filter for either passing, filtering portions of the optical signal having respective different wavelengths (col. 3, lines 33-45)”. Applicant respectfully disagrees. Col. 3, lines 33-45 of Roberts reads as follows:

modulating the spectrum of the pulse with a set of spectral modulations associated with respective channels such that a respective channel value for each channel is represented by an amount of corresponding spectral modulation, wherein each spectral modulation is defined by a respective characteristic modulation as a function of frequency and wherein the characteristics are mutually orthogonal in frequency space.

Such spectral modulation (referred to below as Fourier modulation) may conveniently be in the form of sinusoidal modulations in frequency space which may then be detected by Mach-Zehnder filters at a receiver.

Roberts does not supply the deficiencies in Knox as described above with to claims 1 and 19. Furthermore, neither Knox nor Roberts discloses a "plurality of optical modulators has a different pass band, and wherein the passing and the optically modulating comprise passing and optically modulating the desired portion of the optical signal within the pass band of the optical modulator and not passing and not modulating other portions of the optical signal outside of the pass band" as recited in claim 4, nor does Roberts disclose "filtering the other portions of the optical signal using the optical modulator" as recited in claim 5. For similar reasons, neither Knox nor Roberts discloses the subject matter of claims 22 and 23.

For at least all the above reasons, claims 3-5, and claims 21-23 are not unpatentable over Knox in view of Roberts and should be allowable in their present form.

Claims 6 and 24 have been canceled, and the rejection of those claims is, accordingly, now moot.

B. Claims 10-12 were rejected under 35 U.S.C. §103 as being unpatentable over Roberts in view of Wilner et al. (U.S. Patent No. 6,341,021).

In rejecting claims 10-12, the Examiner asserts that Wilner discloses an optical modulator comprising a filter having a pass band for selecting the optical signal within the pass band for modulating and filtering the optical signal outside of the pass band using the optical modulator, and refers to col. 7, lines 20-37 of Wilner as disclosing this feature. Applicant respectfully disagrees.

Wilner discloses, as shown, for example, in **Fig. 1A**, that after optical signals are modulated by modulators AO1....AO_n, the modulated signals are combined by coupler 18. The combined signal is then fed back to the modulators using a feedback loop 22, and filters OF1....OF_n in the feedback loop reconverts the combined signal back to separate signals to be directed to the modulators.

Thus, in Wilner, it is the combined, modulated signal outputs of the modulators that are filtered. There is no disclosure of an optical modulator comprising “a filter having a pass band” as recited in claim 10, or that the optical modulators perform filtering as recited in claims 11-12.

Furthermore, as discussed previously, Roberts also does not disclose frequency modulation as recited in claim 10. Claims 10-12, accordingly, are not obvious over Roberts in view of Wilner, and should be allowable in their present form.

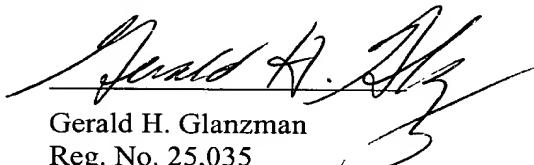
IV. CONCLUSION

For at least all the above reasons, claims 1-5, 7-14, 16-23, 25-28 and 30-36 are believed to be allowable in their present form, and this application is believed to be in condition for allowance. It is, accordingly, respectfully requested that the Examiner so find and issue a Notice of Allowance in due course.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,



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